

CLAIMS

What is claimed:

1. A method of making a microelectronic assembly, comprising:

improving wetting and flow characteristics of a no-flow underfill material by preheating the no-flow underfill material;

assembling a construction including a carrier substrate, a microelectronic die having an integrated circuit, and the no-flow underfill material between the carrier substrate and the die, the wetting characteristics having been improved before the construction, including the carrier substrate, the microelectronic die and the no-flow underfill material, is assembled;

reflowing interconnection elements between the carrier substrate and the microelectronic die of the construction by heating and subsequently allowing the interconnection elements to cool; and

curing the no-flow underfill material of the construction by heating the no-flow underfill material for a period of time sufficient to harden the no-flow underfill material.
2. The method of claim 1, wherein the no-flow underfill material is preheated before coming into contact with either the microelectronic die or the carrier substrate.

3. The method of claim 2, wherein the construction is assembled by dispensing the no-flow underfill material on the carrier substrate and subsequently locating the microelectronic die adjacent the no-flow underfill material.
4. The method of claim 3, further comprising:
holding the microelectronic die with a chuck while the interconnection elements are being reflowed; and
releasing the chuck from the microelectronic die.
5. The method of claim 2, wherein the construction is assembled by dispensing the no-flow underfill material on the microelectronic die and subsequently locating the carrier substrate adjacent the no-flow underfill material.
6. The method of claim 5, further comprising:
holding the microelectronic die with a chuck while the interconnection elements are being reflowed; and
releasing the chuck from the microelectronic die.
7. The method of claim 1, wherein the no-flow underfill material is preheated at a temperature between 30°C and 120°C.

8. The method of claim 7, wherein the interconnection elements are reflowed at a temperature of at least 183°C.

9. A method of making a microelectronic assembly, comprising:
dispensing a no-flow underfill material on a die having an integrated circuit;
subsequently locating a carrier substrate adjacent the no-flow underfill

material;

reflowing interconnection elements between the carrier substrate and the microelectronic die by heating and subsequently allowing the interconnection elements to cool; and

curing the no-flow underfill material by heating the no-flow underfill material for a period of time sufficient to harden the no-flow underfill material.

10. The method of claim 9, further comprising:

preheating the no-flow underfill material before dispensing the no-flow underfill material on the die.

11. The method of claim 9, further comprising:

preheating the underfill material after the carrier substrate is located adjacent the no-flow underfill material but before the interconnection elements are reflowed.

12. The method of claim 9, further comprising:
 holding the microelectronic die with a chuck while the interconnection elements are being reflowed; and
 releasing the chuck from the microelectronic die.
13. The method of claim 9, wherein the no-flow underfill material is preheated at a temperature between 30°C and 120°C.
14. The method of claim 13, wherein the interconnection elements are reflowed at a temperature of at least 183°C.
15. A method of making a microelectronic assembly, comprising:
 assembling a construction including a carrier substrate, a microelectronic die having an integrated circuit, interconnection elements between the carrier substrate and the die, and a no-flow underfill material between the interconnection elements;
 subsequently heating the underfill material to a temperature below a reflowing temperature of the interconnection elements;
 subsequently connecting the die with a chuck; and
 reflowing the interconnection elements by heating the interconnection elements while the die is held with the chuck.

16. The method of claim 15, wherein the construction is assembled by dispensing the no-flow underfill material on the carrier substrate.
17. The method of claim 15, wherein the no-flow underfill material is preheated at a temperature between 30°C and 120°C.
18. The method of claim 17, wherein the interconnection elements are reflowed at a temperature of at least 183°C.